

Proposal for Particle Acceleration by Photonically-Magnetized Multi-Beam System Featuring Tri-Focal, Three-Ring Particle Accelerator

Pierre L. Coulomb
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As particle accelerators at least, ostensibly, seem to be producing diminished returns on research funds invested, the inherent inefficiencies of particle accelerators including the reliance upon magnets which are placed a comparatively long distance from the particles which they accelerate.

As some accelerator facilities are already collocated with extreme light sources, this author wishes to propose a novel approach which could allow for a more efficient leveraging of existing systems in order to achieve particle energies which far exceed the current state of the art.

This author proposes that a slight modification be made to the existing superconducting electromagnets so that multiple beams can be made to circulate in close proximity to one-another. The first; or primary; beam would contain the materials which one wishes to collide for the purposes of the experiment (of extremely low density) and the supporting magnetically-active beams would be of a greater density and would be composed of materials which, if struck with an extreme light source, would produce their own magnetic fields. The proximity of the pincer-like photonically-magnetized beams to the primary beam would make it a more efficient lever of the ions or other particles one would wish to accelerate.

The secondary beams i.e. the beam being magnetized using the X-Ray LASER, would not need to accelerate at anywhere near the velocity of the primary beam and would merely need to be suspended in-place, a fixed distance from the primary beam, ideally about a millimeter above and below the primary beam rather than on paths in-plane with the primary magnets.

Although having multiple point-focii of magnetism would slightly reduce the magnetic acceleration of the primary beam, the presence of the supporting magnetic-leveraging beams would offer benefits which would more than make up for this difference. As we would be able to direct an X-Ray LASER at points along the track where the accelerator ions could be predicted to be at a given time using rapid switching, the velocities made possible via this method surpasses that which is possible using superconducting magnets alone.

In order to work, once the LASER-based acceleration engages, the magnetism of the superconducting magnets must be entirely blocked from interacting with the primary track or else the magnetic field will conflict with the effect one is trying to create with the secondary beams. The most efficient means of achieving this effect would be to incorporate a mechanism into the superconducting magnets which allows for the chilled magnets to be selectively heated to above the superconductive transition temperature in order to prevent the conveyance of meaningful amounts of magnetism through the system to the narrow central track. A collimated X-Ray LASER of modest power could be affixed to each magnet in order to confer this tunability.

This benefits of accelerating particles in this mode of operation could be compared to the additional velocity of a baseball thrown by an experienced pitcher who makes a point fully exploiting opportunities for generating additional leverage by not “snapping” merely his elbow, but exploiting the leverage afforded by the wrist and knuckle joints, as well, much like a trebuchet. Particles could be accelerated to extreme velocity through the conventional mode of acceleration prior to the secondary system being engaged. The Adjacent Beam Accelerator (ABA) would then take the primary beam the remainder of the way to the desired velocity.